

A combination of frequency photoacoustic and photoacoustic spectroscopy techniques for measurement of optical and thermal properties of macromolecular nanostructures

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Abstract Macromolecular nanostructures represent a class of materials of considerable interest for application in nanooptics and nanoelectronics. The potential applications require understanding of the transport mechanisms in macromolecular nanostructures, and the recent theoretical studies indicated that the transport mechanisms of heat generated by absorption of IR and visible light are different. In this paper is proposed a combination of experimental techniques that would enable simultaneous measurement of optical and thermal properties of macromolecular structures excited by wide spectrum of light. The results of the experiments would enable credible testing of validity of the predictions of the theoretical studies, and further insight of the transport processes in macromolecular nanostructures.

Keywords Photoacoustics · Heat transport · Macromolecular nanostructures

1 Introduction

Macromolecular nanostructures are recently gaining increased attention as materials that have numerous potential applications in fields of nanooptics and nanoelectronics (Mirkin and Letsinger 1996; Braun et al. 1998; Alias et al. 2013; Xu et al. 2014). The practical

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